Mechanism of Onset Study – General Data Sheet

(Percentages rounded to the nearest 10th of 1%)

Wayne Rath, PT, Dip MDT & Jean Duffy Rath, PT, Dip MDT
Founders of the Duffy-Rath System

This is consecutive case-series investigation of the mechanism of onset for patients referred for physical therapy treatment of activity-related musculoskeletal disorders at an onsite industrial clinic where employees with and without work-related injuries are seen.

Based upon a structured history-taking process, the mechanism of onset is categorized into one of the following categories:

1. **No incident or event (NIE)** – the patient unable to pinpoint a specific incident or event that started their problem.
2. **Incident Type A** – the patient can identify a specific incident or event, but it involves normal activities that are not normally a problem – there is no unusual or traumatic component of force: e.g., they lifted something they normally lift without problems or difficulty, they simply reached for something, turned their head, got up from sitting or bending over etc.
3. **Incident Type B** – the patient can identify an unusual, unguarded, or unexpected force associated with the onset, but there is no impact, and it is not necessarily a traumatic incident or event: e.g., slipped but did not fall, lifting something that started to fall and caught it etc.
4. **Trauma** – the patient can identify a high velocity and/or high magnitude force with impact that caused the onset: e.g., car accident, fell, twisted an ankle playing a sport etc. This is apparent and unambiguous, immediately at the time of the incident.

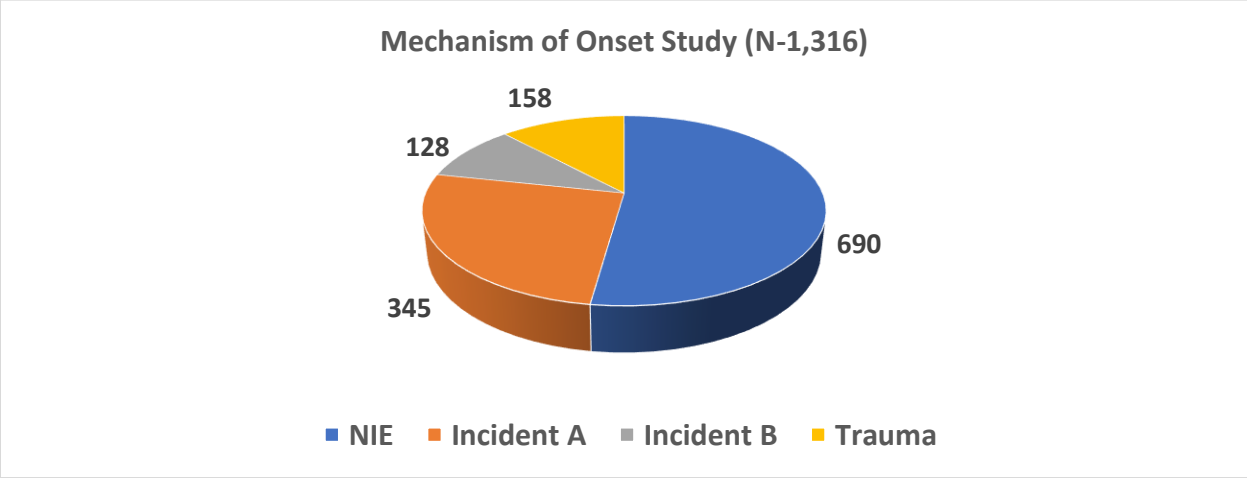
Category	NIE	Incident Type A	Incident Type B	Trauma	Unknown	Totals	Study Population (Less Unknown & Other)
Overall	***690***	***345***	***128***	***158***	***15***	***1331***	***1316***
Population %	*52.4*	*26.2*	*9.7*	*12.0*	*N/A*	*N/A*	*100*
Work-related	**462**	**295**	**109**	**103**	**9**	**975**	**966**
Group %	47.8	30.5	11.3	10.7	N/A	N/A	*100*
Population %	35.1	22.4	11.2	7.8	N/A	N/A	*73.6*
Not Work-related	**228**	**50**	**19**	**55**	**6**	**356**	**350**
Group %	65.1	14.3	5.4	15.8	N/A	N/A	*100*
Population %	17.3	3.8	1.4	4.2	N/A	N/A	*26.7*
Low back	**165**	**144**	**18**	**17**	**2**	**346**	**344**
Group %	48.0	41.9	5.2	4.9	N/A	N/A	100
Population %					N/A	N/A	26.1
Neck	**102**	**43**	**6**	**7**	**0**	**158**	**158**
Group %	64.6	27.2	3.8	4.4	N/A	N/A	100
Population %					N/A	N/A	12.0
Mid-back	**13**	**16**	**2**	**3**	**0**	**34**	**34**
Group %	38.2	47.0	5.9	8.8	N/A	N/A	100
Population %					N/A	N/A	2.6
Spine Combo	**24**	**6**	**5**	**8**	**0**	**43**	**43**
Group %	55.8	14.0	11.6	18.6	N/A	N/A	100
Population %					N/A	N/A	3.3
LB + Leg	**3**	**4**	**0**	**1**	**0**	**8**	**8**
Group %	37.5	50.0	0	12.5	N/A	N/A	100
Population %					N/A	N/A	0.6

C/T + Upper Limb	**47**	**4**	**6**	**7**	**0**	**64**	**64**
Group %	73.4	6.3	9.4	10.9	N/A	N/A	100
Population %					N/A	N/A	4.9
Spine Sub-total:	***354***	***217***	***37***	***43***	***2***	***653***	***651***
Group %	54.4	33.3	5.7	6.6	N/A	N/A	100
Population %	26.9	16.5	2.8	3.3	N/A	N/A	49.5
Shoulder	**69**	**61**	**16**	**21**	**3**	**170**	**167**
Group %	*41.3*	*36.5*	*9.6*	*12.6*	N/A	N/A	*100*
Population %					N/A	N/A	12.7
Elbow	**63**	**19**	**14**	**5**	**1**	**102**	**101**
Group %	62.4	18.8	13.9	5.0	N/A	N/A	100
Population %					N/A	N/A	7.7
Wrist/Hand	**90**	**13**	**3**	**28**	**2**	**136**	**134**
Group %	67.2	9.7	2.2	20.9	N/A	N/A	100
Population %					N/A	N/A	10.2
Arm Combo	**34**	**4**	**5**	**2**	**0**	**45**	**45**
Group %	75.6	8.9	11.1	4.4	N/A	N/A	100
Population %					N/A	N/A	3.4
U-Limb Sub-total:	***256***	***97***	***38***	***56***	***6***	***453***	***447***
Group %	57.3	21.7	8.5	12.5	N/A	N/A	100
Population %	19.5	7.4	2.9	4.3	N/A	N/A	34.0
Hip	**5**	**2**	**0**	**0**	**0**	**7**	**7**
Group %	71.4	28.6	0	0	N/A	N/A	100
Population %					N/A	N/A	0.5
Knee	**34**	**25**	**42**	**26**	**1**	**128**	**127**
Group %	26.8	19.7	33.1	20.5	N/A	N/A	100
Population %					N/A	N/A	9.7
Ft/Ankle	**35**	**4**	**11**	**25**	**0**	**75**	**75**
Group %	46.7	5.3	14.7	33.3	N/A	N/A	100
Population %					N/A	N/A	5.7
Leg-Combo	**1**	**0**	**0**	**0**	**0**	**1**	**1**
Group %	100	0	0	0	N/A	N/A	100
Population %					N/A	N/A	0.08
L-Limb Sub-total:	***75***	***31***	***53***	***51***	***1***	***211***	***210***
Group %	35.7	14.8	25.2	24.3	N/A	N/A	100
Population %	5.7	2.4	4.0	3.9	N/A	N/A	16.0
Other (3 NWR /2 WR)	**5**	**0**	**0**	**0**	**0**	**5**	**0**
Group %	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Population %	N/A	N/A	N/A	N/A	N/A	N/A	N/A

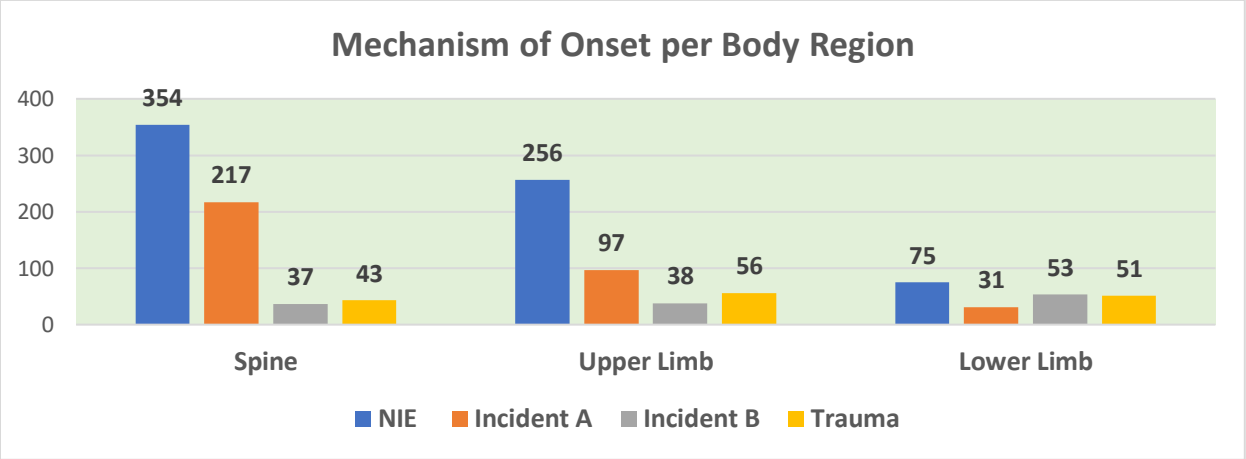
Overview of the DRS History-taking Process to Identify the Mechanism of Onset (MOO):

1. The patient is asked to identify when and how their current problem started.
2. Trauma is identified as the MOO when there is clear and unambiguous evidence of high velocity, large magnitude impact loading to the musculoskeletal system.
3. No Incident or Event (NIE) is identified when the patient unambiguously reports there is no identifiable event, incident or trauma that led to the onset of their symptoms and signs.
4. Further questioning is pursued when the MOO is not clearly trauma or NIE:
   - 4.1 The patient is asked to identify exactly when their first symptoms commenced.
   - 4.2 If they cannot identify when the first symptoms commenced, and they cannot identify any event or incident in which the affected body region was strained, the MOO is NIE.
   - 4.3 If they can identify when the first symptoms commenced, a biomechanical analysis of the event or incident is obtained.
     - 4.3.1 If the event or incident involves no unusual biomechanical forces (i.e., an activity normally performed without incident) the MOO is Incident Type-A. The position of the body part and the type of biomechanical loading are identified.
     - 4.3.2 If the event or incident involves an unusual, unguarded or unexpected biomechanical force (i.e., a slip, but did not fall, attempted to catch a falling box etc.) the MOO is Incident Type-B. The position of the body part and the type of biomechanical loading is identified.

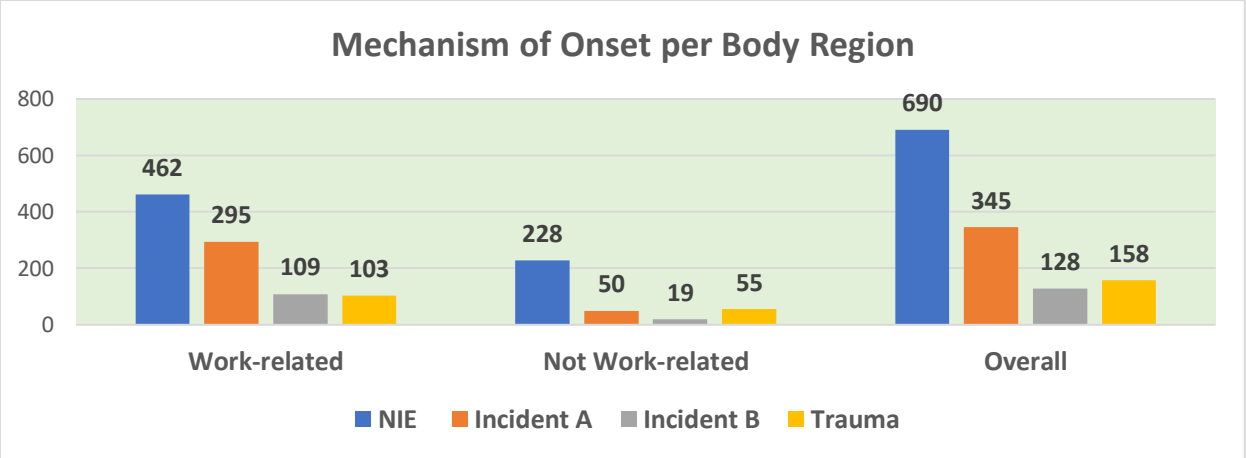
I. Overall Analysis - Mechanism of Onset for Musculoskeletal Disorders: for the entire study population, three-quarters of the patients had a mechanism of onset that was related to repetitive use patterns (NIE + Incident A). Slightly more than half were NIE – the largest single category. These findings are consistent with a fatigue-related onset to the majority of MSDs which is what renders them preventable according to the Duffy-Rath System.



II. **Body Region Analysis - Mechanism of Onset for Musculoskeletal Disorders:** lifestyle factors (NIE and Incident A) are proportionately more prevalent with spine and upper limb disorders than for lower limb disorders. There were many more spine and upper disorder patients than those with lower limb injuries.



III. **Work-related Analysis - Mechanism of Onset for Musculoskeletal Disorders:** lifestyle factors (NIE and Incident A) in combination are proportionately as prevalent with work-related as with not work-related musculoskeletal disorders. However, the work-related group is more likely to describe and incident (type A), than the not work-related group.



NOTE: we have collected data regarding the MOO of musculoskeletal disorders for over 40 years now and these patterns have remained consistent with 3 separate private practices and at the many different companies we have worked for over the years.

For more information contact:

Wayne Rath, PT, Dip MDT, CEAS
wayne@duffyrath.com